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RINGING AND RECAPTURE OF SPOTTED GROUND THRUSHES *TURDUS FISCHERI FISCHERI* AT GEDE, KENYA COAST: INDICATIONS OF SITE FIDELITY AND POPULATION SIZE STABILITY

L.A. Bennun

The Spotted Ground Thrush *Turdus fischeri* is a threatened bird, listed in the ICBP/IUCN Red Data Book for Africa (Collar & Stuart 1985). The nominate race is a seasonal visitor to coastal forests in Kenya from unknown breeding grounds (Britton & Rathbun 1978), and has been studied at Gede Ruins National Monument where ten birds were colour-ringed in July–August 1983 (Bennun 1985). Two years later, in August 1985, a colour-ringed bird was recorded at Gede by A.N.B. Masterson (*in litt.*), while in mid-October that year three birds, presumably on passage, were seen by M. Fisher in a garden at Watamu, about 6 km from Gede (D.A. Turner *in litt.*): two had colour rings. To follow up these records I revisited Gede in late July 1986.

METHODS

Mist-nets were operated at nine sites within the forest (Fig. 1): at all five (A, C, E, F and H) where *T. fischeri* were captured in 1983 (see Bennun 1985) and at two new sites (J and M). Netting took place from 24 July to 1 August 1986, with between three and six net sessions (morning or evening) at each site. All net sites were surveyed and mapped. The net where each bird was captured was noted, for each species, and *T. fischeri* capture points were noted to the nearest half-metre along the net. New *T. fischeri* and all Red-capped Robin Chats *Cossypha natalensis* were colour-ringed with unique colour combinations. Patrick Gathu and E.K. Gachoya assisted throughout with mist-netting and ringing.

SITE FIDELITY

Nine *T. fischeri* were caught in all, during 17 net sessions (versus ten in 23 sessions in 1983). Three of these were birds that had been ringed three years previously; no colour rings had been lost, although some were dirty and faded. Capture locations are shown in Fig. 1. With the exception of site E, all sites where the species had been trapped in 1983 again produced *T. fischeri*; birds were also caught at new sites J and M. At sites C, F and H unringed birds were caught in the former home ranges of 1983 birds.

In 1983, individual *T. fischeri* seemed very sedentary, moving within a small well-defined home range (Bennun 1985). Two of the birds recaptured in 1986 appeared to have returned to the same home ranges they had used three years before. R/DG was captured twice at site A, the first time 4 m and the second 3 m from the nearest points where it was located in 1983. This bird had been seen along the same stretch

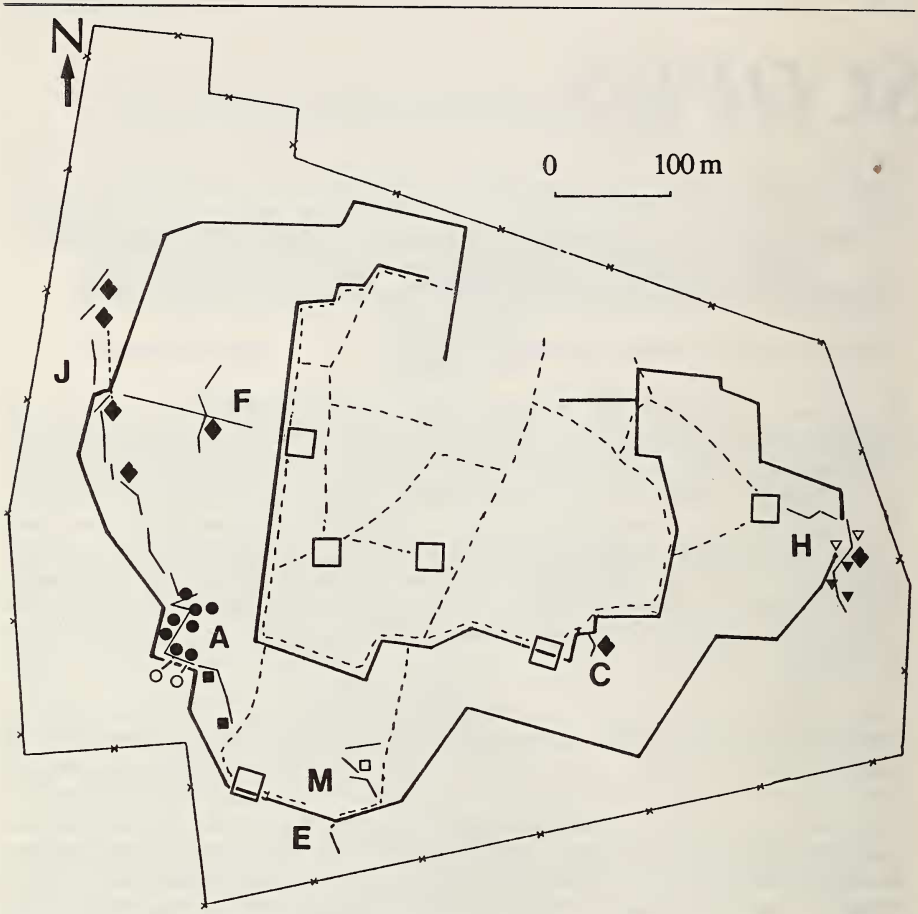

Fig. 1. Map of Gede Ruins National Monument (scale approximate).

Key: ---- path; ▭ ruined building; ⟷ forest edge;
▬ ruined wall

A, **C**, **E**, **F**, **H**, **J** and **M** are net sites (**A** and **H** redrawn since 1983);
—— position of net.

Ground Thrush location/capture points shown by the following symbols:

◆ new (unringed) bird in 1986 (dotted line joins points for one bird)

▼ W-W/DB/LG in 1983	▽ in 1986
■ R/W in 1983	□ in 1986
● R/DG in 1983	○ in 1986

of path in 1985 (A.N.B. Masterson *in litt.*). Two capture points for W-W/DB/LG (formerly P/LG) at site H were 1 m and 16 m away from the nearest 1983 point.

The third recapture was of R/W at site M, 120 m away from its 1983 capture point at site A. This bird, the only one identified in 1983 as a sub-adult, also showed the greatest single movement (40 m) of any individual in that year (Bennun 1985): possibly it had not at that stage established a clear home range.

Of other birds ringed in 1983, one Pygmy Kingfisher *Ispidina picta* and four *Cossypha natalensis* were recaptured out of three and 37 ringed respectively; both species are also non-breeding visitors to Gede. The single kingfisher, trapped at site J, was approximately 100 m from its 1983 capture place at site F. The four *C. natalensis*, interestingly, appeared to have returned to the same areas of forest as in 1983: three were captured at the same net site where they were originally ringed, while the fourth was originally caught either at the same net site or at one 150 m away. Unfortunately, precise records of 1983 capture points for *C. natalensis* are lacking, although the species appeared considerably more mobile than *T. fischeri* (Bennun 1985). Six *C. natalensis* were trapped twice during the 1986 netting, and these showed mainly small movements: distances, measured between mid-points of capture nets, were 10 m (captures in same season, 2 h apart), 60 m (captures on same day, different sessions), 0 m, 0 m, 8 m, and 20 m (captures on different days). Home ranges for *C. natalensis* may be better defined than previously suspected, although probably larger than those of *T. fischeri*; relocations of some of the 32 individuals now with colour rings should help to resolve this.

OVERLAPPING HOME RANGES

More circumstantial evidence that the home ranges of some *T. fischeri* might overlap can be added to that found in 1983. At site H an unringed bird was captured at precisely the same point where W-W/DB/LG had been caught the previous day. At site J an unringed bird was observed foraging, preening, then turning to face towards a net some 15 m away; standing quite still, it uttered a long series of thin *tswee* notes; these were not answered and after some minutes the bird resumed foraging and moved away. The net was inspected immediately afterwards and another unringed *T. fischeri* found caught. It is noteworthy that a century ago birds at Kipini were frequently in pairs (Fischer 1879, referred to by Collar & Stuart 1985).

POPULATION SIZE STABILITY

The numbers of birds caught in 1983 and 1986 cannot be compared directly, but it is possible to examine the relative numbers of *T. fischeri* and two other ground-dwelling thrushes, *C. natalensis* and the resident Eastern Bearded Scrub Robin *Cercotrichas quadrivirgata*. The proportions found in 1983 are virtually unchanged three years later (Table 1). Clearly any change in numbers has at least affected all three species equally. Factors affecting their populations would not be identical, however; while *Cercotrichas quadrivirgata* should breed at Gede, *C. natalensis* and *T. fischeri* breed elsewhere, apparently at different times and probably in different places. The result can thus be taken as an indication of likely size stability in all three populations at Gede. While this is much more encouraging than any decline in relative *T. fischeri* numbers would have been, it cannot be taken as proof that the population of *T. f. fischeri* is remaining steady as a whole. Gede, an apparently optimal habitat for this species, could be fully occupied even while total numbers were declining.

Table 1

Totals and ratios of numbers caught for three ground-dwelling thrushes at Gede in 1983 (from Bennun 1985) and 1986

		1983	1986
Total:	*Cossypha natalensis*	37	32
	Turdus fischeri	10	9
	Cercotrichas quadrivirgata	5	5
Ratio:	*C. natalensis/T. fischeri*	3.7	3.6
	T. fischeri/C. quadrivirgata	2.0	1.8

SURVIVORSHIP

At least three out of ten *T. fischeri* were still alive three years after they were first recorded. If some of the remaining seven had shifted slightly from their 1983 home ranges, they may have been missed as there was no time to mount a thorough search for colour-ringed birds away from the net sites. The presence of unringed birds in several 1983 home ranges suggests that the original occupants had died, but their fate cannot be certainly established. The recaptures imply a *minimum* annual adult survivorship of $0.3^{1/3}$, i.e. 67 per cent, which is already among the higher values recorded elsewhere for African passerines (see Fry 1980, Brown & Britton 1984, Hanmer 1984a,b).

AGEING

No *T. fischeri* caught could certainly be identified as sub-adult; all had completed or nearly completed wing moult and had fresh body plumage (although several were still moulting rectricies). Brownish-buff tips to the tertials and wing coverts do not indicate immaturity; they occurred on fresh feathers and on one (undoubtedly adult) bird retrapped from 1983. There was great individual variation in the extent to which these buff tips were present. The immature features described by Keith & Twomey (1968) from a specimen taken in May (duller spots below, rufous tips to crown feathers, rufous streaks in the centre of some wing coverts) may not be easily distinguishable by late July; this may be a simple explanation for the age structure found in 1983 (Bennun 1985).

BEHAVIOURAL NOTES

Although no effort was made to observe *T. fischeri,* the species was much more conspicuous than in 1983; the leaf litter seemed drier and the rustling noise made as the birds moved over it made them easier to locate. One unringed bird was seen to displace a *Cossypha natalensis* that approached it. The bird was perched motionless on a fallen branch, watching me, when the *C. natalensis* flew down from the low canopy to a branch half a metre away. The *T. fischeri* flew at it and occupied the spot, while the *C.natalensis* moved off half a metre and perched again. The *T. fischeri* flew at it vigorously, this time loudly snapping its beak; the *C. natalensis* merely flew to the ground and began to forage. Shortly afterwards the *T. fischeri* did the same, as usual plunging its beak directly into the leaf litter and throwing up leaves and debris. After one plunge it came up with a large millipede, about 8 cm long. It flew at once with this into the low tangled bole of a tree, less than 1 m from the ground, and be-

gan directly—and with some difficulty—to swallow its prey. Afterwards it stood motionless and gaped for some time, then moved quietly away. From stomach contents millipedes *Prionopetalum* spp. are known to form a part of the species' diet (Britton & Rathbun 1978, Bennun 1985).

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L.A. Bennun, Box 21149, Nairobi, Kenya

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